

Mechanism of transition to turbulence in a circular cylinder wake in a channel

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Abstract

© 2017 The Authors, published by EDP Sciences. Transition to turbulence in the circular cylinder wake has been studied experimentally and numerically at growing Reynolds number. Good agreement of calculation results with the flow visualization and measurements of instantaneous vector fields of velocity and vorticity has been demonstrated. The growing Reynolds number is shown to make large-scale vortex generation onset move upstream. It also triggers the transition to 3D flow pattern in the cylinder wake. This process is accompanied by non-monotonous behavior of the profiles of velocity and its turbulent fluctuations at equal distances from the cylinder. Non-monotonous behavior of the cylinder drag has been revealed for the Reynolds numbers ranging from 120 to 300.

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